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H_2S: A hazard or a pathway towards value creation

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Abstract:

Sour natural gas compositions can vary over a wide concentration of H_2S and CO_2 and a wide concentration of hydrocarbon components. If the H_2S content exceeds the sales gas specification limit, the excess H_2S must be separated from the sour gas. The removal of H_2S from sour gas is called "sweetening." The concept of our research is simultaneous catalytic conversion and separation of H_2S. The main objective is studying the feasibility of capturing H_2S followed by its conversion in a liquid phase. In this case, one possible route for H_2S capture is absorption in a primary liquid phase. The absorbed H_2S then can be directly converted in a same unit operation. Bi-phasic homogenous catalytic and/or phase transfer catalytic systems can be used to produce organic materials (e.g. thiols) from H_2S absorbed in the primary liquid phase. A basic illustration of the proposed concept is shown in the scheme below (Figure 1).

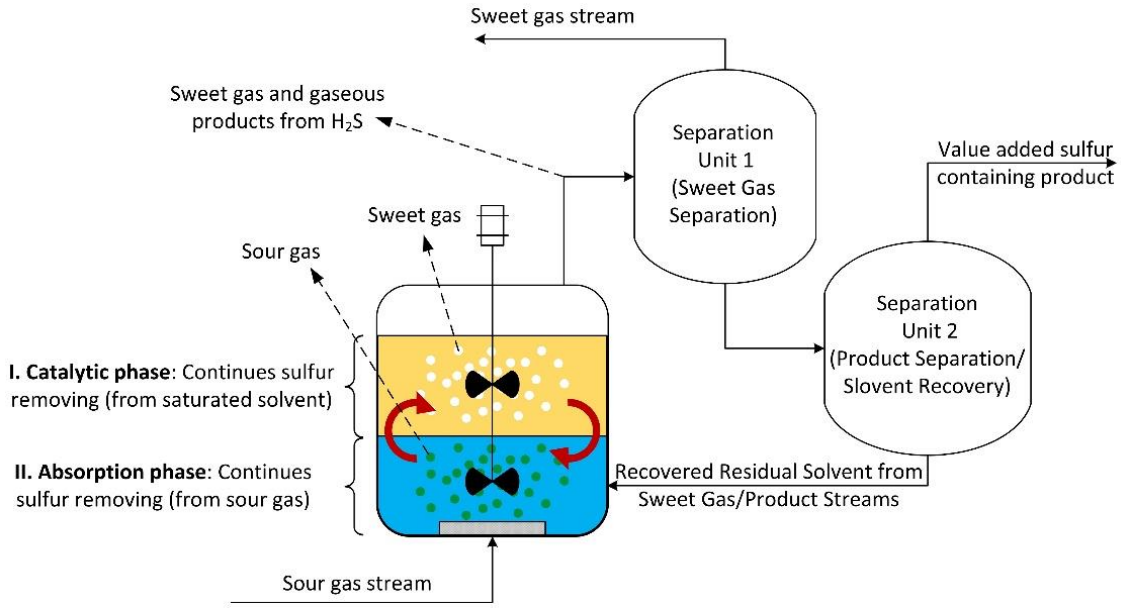

Figure 1. Schematic illustration of the proposed concept.